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ABSTRACT

A cross-national analysis was conducted to identify contextual influences that shape policies regarding the school-to-work transition and education-work linkages. The study's theoretical framework included principles based on technical-rational perspectives and neo-institutional perspectives. The study tested the following hypotheses: (1) schools are training grounds for employment; (2) individuals' employability skills and attributes are the foundation for collective socioeconomic benefits and well-being; (3) employable individuals possess theoretical understanding of work-related processes rather than work-specific skills alone; (4) making schools accountable to businesses and communities improves individuals' academic performance; and (5) school-work relationships, once institutionalized, persist and are maintained regardless of their actual technical output or original incentives. The study relied on comparative data from U.S. grade 12-equivalent student, teacher, and principal questionnaires from the Third International Mathematics and Science Study. Simple descriptive statistics, bivariate correlations, and multilevel multivariate regression were used to analyze and predict the nested relationships between students, schools and their communities, and relevant national-level factors. The analysis established that, although school-to-work transition policies and reforms have limited influence on the technical output of school-work linkages, they are legitimizing efforts that may still benefit the systems implementing them. (The bibliography lists 13 references. Two tables of descriptive statistics are appended.) (MN)

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EDUCATION-WORK LINKAGE AND POLICY: A CROSS-NATIONAL ANALYSIS OF CONTEXTUAL INFLUENCES ON SCHOOL TO WORK TRANSITION

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EDUCATION-WORK LINKAGE AND POLICY: A CROSS-NATIONAL ANALYSIS OF CONTEXTUAL INFLUENCES ON SCHOOL TO WORK TRANSITION

ABSTRACT

By using multilevel contextual analysis, we (1) identify the limitations of technical-rational perspectives at the national and cross-national levels, and (2) show that policy on school to work transition and school-work linkages is limited in its influence on technical output of these linkages, such as employment rates for new graduates. Instead, our evidence suggests that these policies and reforms are legitimizing efforts that still may bring benefit to the systems implementing them regardless of the technical output of school to work transition programs and the penetration of business-oriented influence into the governance of schooling.

EDUCATION-WORK LINKAGE AND POLICY: A CROSS-NATIONAL ANALYSIS OF CONTEXTUAL INFLUENCES ON SCHOOL TO WORK TRANSITION

OBJECTIVES

School to work transition is a historically persistent topic in educational policymaking and reform, affecting both local school districts and national systems (Bailey 1995; Flynn 1995). Beginning in the 1980s, however, school to work transition as a policy issue has seen a two-decade revival of interest (Commission on Excellence in Education 1983; Commission on the Skills of the American Workforce 1990; Secretary's Commission on Achieving Necessary Skills 1991). The standards and rigor of this education-work policy issue are compromised by the relative bias of both policymakers and research reports meant to inform them, which defines school to work transition as a straight-forwardly technical and rational process. Yet, the context both at local and national levels has been shown to not only influence but in many cases also guide educational processes. Given school to work transition's persistence in policy and reform agendas and dominance by assumptions in both policy and research that the school to work transition is a technical and rational process (for example Glover & Marshall 1993; Hamilton 1990, 1995), our analysis explores whether technical-rational processes or the contexts in which schooling and school to work transition occur are more influential in determining education-work linkages.

THEORETICAL FRAMEWORK

Technical-Rational Perspectives

Educational policymakers rely on perspectives of school-work linkage in which schooling's function is to prepare students for the labor market and productive citizenship through a strictly technical and rational process. From a technical-rational perspective the goal of school to work transition is and should be to strengthen and affirm academic standards in public education while creating a ready-made labor force brimming with technological understanding and the ability for self-retraining as actual technological processes evolve. The direct link between schools and employment suggests that making schools accountable to or creating an institutional bridge between businesses' and communities' improves schools' academic and employers' economic outcomes. Therefore, school to work programs reduce or eliminate the need for employers to train new employees or retrain old employees for new tasks by aligning school-based learning with work-based outcomes. With this, the burden of economic productivity and growth may be squarely placed on schools because, according to technical-rational perspectives, school to work transition is a linear and logical process beginning with schooling and ending with career employment.

Much of the school to work policy and research literature connects education and economics while referring to system-wide well-being. Okano (1993) reports that technical-rational accounts of school to work depict the intersection of education and training in terms of economic performance, such as productivity, economic growth, or income shares at both the individual and aggregate levels. Likewise, Lyall (1997) reports that school to work literature focuses on two perceived dilemmas: 1) graduates cannot find the work they desire or 2)

employers cannot find qualified graduates to employ. Thus, the 'health' of school to work transition is a question of a society's economic well-being. An emphasis on schools as sites for employee preparation, therefore, suggests that schools are training grounds for employment. Technical-rational explanations for the school-work transition and relationship focus on the symbiotic nature of schooling and employment, further suggesting that links between education and work should be extensions of employment training, and therefore reflect vocationally-specific content and skill learning. According to a technical-rational perspective, then, the most important element of school to work is the incorporation of vocationally-applicable and vocationally-specific skills into schools.

The implications of this arrangement may be extended beyond the individual to the larger, nationally-defined economic system. In other words, individuals' skill competencies affect the economic well-being of whole social and economic systems. Raizen (1994) asserts that research focusing on individual achievement affords educational policymakers and practitioners the opportunity to implement reforms that not only benefit the individual, but also the society and system to which the individual belongs. By focusing on specific skills and programs meant to aid in the transition from school to work, policymakers and scholars such as Raizen attempt to restore presumably imperfect or unwell systems. Some even consider individuals the vanguard preventing economic and thus social deterioration. Glover and Marshall (1993, p.588), for instance, bemoan that U.S. students' individual skill competencies are not a focus of the educational system. They bluntly argue that "America has the worst approach to school-to-work transition of any industrialized nation." These arguments of scale and influence suggest that individuals' employable skills and attributes are the foundation for collective socioeconomic benefits and well-being. Accordingly, school to work programs produce students with increased

levels of economic productivity creating a competitive advantage for those countries or regions that have such programs.

With the individual and employer levels of analysis identified, technical-rational school to work literature consistently cites two problems affecting school to work transition in particular: 1) constantly changing technology and 2) new work organization needs (Commission on the Skills of the American Workforce, 1990; Department of Education, 1994; Hamilton, 1990; Kanaya, 1994; Marshall, 1992; Nothdurft, 1989; Raizen, 1994; Sako, 1994a; Stern, 1995; Stern et al., 1996; Stern et al., 1992). These problems are often used to suggest that society has become and is becoming more complex, leading to needs for more highly trained and skilled individuals.

A technical-rational perspective suggests that the pace of technological change in the 1980s and 1990s makes their former methods of work structure and hiring obsolete. Because of the temporal nature of applied technology and the permanent nature of theoretical premise and technological understanding, students with strong theoretical backgrounds and knowledge of how to apply this information are the preferred types of new recruit. This focus on quality and theoretical foundation encourages employers to increasingly avoid mass production employee organization in favor of new work organizations, which require employees to participate in all stages of production. These innovations in the workplace have, therefore, required innovations in the nature of employably-skilled individuals suggesting that employable individuals possess theoretical understanding of technological processes rather than technologically-specific skills alone.

These technical-rational assertions of school to work policy and research literature sometimes blend knowledge of existing systems and conditions with hypothetical idealizations.

For example, employers assert that new employees should be highly responsible, educated, and productive (Commission on Excellence in Education, 1983; Commission on the Skills of the American Workforce, 1990; Lankard, 1995; McLaughlin, 1995). Policymakers and school to work scholars report that survey responses show how employers plan to reform their hiring practices and spread responsibility to a concentrated number of multi-task-oriented workers. Sako (1994a), however, observes that if education and work are not integrated then companies that do try to retrain their employees may find that their employees do not know how or do not want to be retrained. Integration of education and work reportedly increases employees' propensity for lifelong learning rather than career stagnation. Given these conditions, technical-rational school to work perspectives assert that workers are more easily replaced than retrained if they do not have a background in education-industry cooperation (Commission on the Skills of the American Workforce, 1990; McLaughlin, 1995; Nothdurft, 1989; Richardson, 1994; Stern et al., 1996; Stern et al., 1995). Consequently, students who learn not only their vocational skills but also how to stay abreast of current trends and discoveries are the most employable because they are the most maintenance-free, productive employees.

Reports on school to work often point out the ever-changing nature of labor force skill requirements and that the need for specific vocational skills is declining or obsolete in many countries (Benavot, 1983). One such report from the Commission on the Skills of the American Workforce (1990) says that changing technologies require a new breed of worker. According to this report, these workers need to perform at high levels within occupational contexts requiring the ability to adapt to many different complex decision-making situations. Hamilton (1990) joins this camp and defines a worker who meets these skill requirements as a flexible specialist. Likewise, Berenbeim (1991) suggests that industry's growing dissatisfaction with the United

States' educational system impels them to encourage policy changes, which they hope will raise students' academic achievement levels.

In this section, we have outlined arguments for school to work transition being a technical and rational process. In particular, a technical-rational perspective of school to work transition through education-work linkage suggests that (1) schools are the cornerstone of job training leading to employability, (2) individual employability produces social and economic benefit at both the individual and national levels, (3) individual employability is a product of the combination of theory and skills, and that (4) school accountability to industry increases employability. Another perspective, however, has arisen in recent years that questions the linearity of technical-rational approaches. This perspective, dubbed neo-institutional, suggests that seemingly technical and rational processes may be separate (i.e., "decoupled") from technical output due to concerns over legitimacy and the influence of popular models of school to work transition that tend to bind or limit rationality.

Neo-Institutional Perspectives

McFarland and Vickers (1994) report that in spite of differences in educational structure and governance, most OECD countries are combining vocational with general education courses and curricula to some degree. Thus vocational education as an independent educational track is fading while general education absorbs and incorporates it (Benavot, 1983). Given this phenomenon, the trend of OECD nations to adopt similar school to work programs is initially a rational trend that quickly becomes more irrational the more the trend becomes institutionalized. International competition and interdependence create a common community in which all nations

participate, willingly or not. In particular, the importance of inclusion in an international economy suggests the need for legitimization within a global economic community. In other words, nation-states cannot compete with others that do not acknowledge their status within this community. A similar argument applies to social institutions as well, particularly schools.

A neo-institutionalist perspective, therefore, suggests that school to work is an educational tool for legitimating a nation-state's inclusion in an international political, economic, and social community. As participation in an expanding international community becomes increasingly important for individual nations, the calls for a standardized and consistently skilled labor force gains voice. Archetypal school to work systems, particularly those modeled on the Japanese and German systems, rise to the surface among policymakers independent of empirical research warranting promotion of these models (for examples see Aitken, 1993; Burnell, 1987; Hamilton, 1990; Hamilton and Glover, 1995; and Wills, 1995). The persistence of these archetypal school to work systems suggests that a system of institutional legitimacy, influences the education-work linkages that are meant to facilitate school to work transition (Meyer & Rowan, 1977).

The structures of school to work systems in internationally competitive nations become models that other legitimacy-seeking educational systems follow. If these models do not match the exact character of the systems employing them, then the adopting system changes the application of the model without changing the overall structure of the model (i.e., "decoupling" occurs). Sometimes this decoupling cannot be helped and the educational systems adopting the script know before its adoption that it cannot be completely or exactly followed. For example, decentralized systems may adopt key points from models taken from centralized systems even though the basic structure of the systems and school to work programs are fundamentally

opposed. Therefore, to further enhance economic and social legitimacy garnered via school to work transition programs, the programs themselves incorporate themselves into established and widely-recognized institutions. Therefore, individuals, local communities, and even national systems legitimize their economic and even institutional participation and competitiveness through adoption of and appropriate adherence to confirmed legitimate models of school to work transition.

Two other aspects of school to work transition through education-work linkages that support the argument that these programs and reforms are attempts to gain international institutional legitimacy focus on the myth of the individual and education as a product of nation-building (Ramirez & Boli, 1987). School to work models focus on individuals' transitions from school to work as key to national economic security and competitiveness. The myth of the individual provides a framework for school to work transition models because the source of value and change in societies emphasizing school to work reform is the individual. Likewise, the educational, economic, and, consequently, occupational influences of school to work transition through education-work linkages contribute to the building of individuals as citizens in a nation-state. Full individual participation in and support of the state occurs when individuals become legitimate citizens with the political and economic rights and responsibilities accompanying citizenship. Education-work linkages afford nation-states and educational systems the opportunity to legitimate their attempts to incorporate individuals into the political and economic body of the nation-state. In other words, alignment of schools with employers eliminates the incentives or agency behind systems that base school to work transition on technical outcomes without eliminating the organizational need for legitimacy. Therefore, education-work linkages

expand and become further institutionalized as states vie for economic, political, and social legitimacy (regardless of their economic, political, and social status or technical output).

Education-work linkages become institutionalized elements of schools' and school systems' legitimacy efforts; therefore, the rational process for determining a need for school to work transition through education-work linkages becomes a process of limited rationality and part of what Meyer and Rowan (1977) attribute to "myth and ceremony." Therefore, as education-work linkages expand, the significance of their outcomes (intended or actual) continues to decrease. The products of education-work linkages become less important as the existence of the linkages becomes more important to maintaining or gaining institutional legitimacy. In other words, a neo-institutional perspective suggests that education-work linkages, once institutionalized, will continue to expand and be maintained regardless of their actual technical output or original incentives. The nature of school to work transition and education-work linkages then becomes superfluous to the legitimizing effort and symbolic importance embodied by the program.

As the persistence of technical-rational school to work policy and reform and education-labor market connections suggests, the popularly hypothesized causally determinant relationship between schools and the economy carries much significance in both developing and developed nations. As a result, programs and policies that encourage and strengthen the school-industry or individual-economy relationship are important indicators of local and nationally-situated communities' economic and developmental status. Regardless of the actual output of such technical-rational processes, however, is a need for communities to legitimize and, to a degree, prove that their inclusion in economically and developmentally restrictive groups is right and appropriate. In this manner, benefits of association can accrue to communities that may not have

actually achieved the requisite level of economic or social development even though their institutions (such as education) suggest that they have by virtue of the number and activities of education-work links meant to facilitate school to work transition.

Hypotheses

Given both the technical-rational and neo-institutional perspectives on school to work transition through education-work linkages, we propose several hypotheses for each theoretical perspective on school to work policy. Our technical-rational hypotheses for education-work linkage indicators are:

(H1) schools are training grounds for employment,

(H2) individuals' employable skills and attributes are the foundation for collective socioeconomic benefits and well-being,

(H3) employable individuals possess theoretical understanding of work-related processes rather than work-specific skills alone, and

(H4) making schools accountable to businesses and communities improves individuals' academic performance.

Our first technical-rational hypothesis, which suggests that schools are training grounds for employment, can be tested by looking at the relationship between the time that students work while in school versus their expected work and postsecondary schooling. Considering the time that students work while in school in relation to the employment rates for recent school leavers can also test it. Both of these relationships should be positive to confirm this hypothesis.

The second technical-rational hypothesis states that individuals' employable skills and attributes are the foundation for collective socioeconomic benefits and well-being. This hypothesis can be tested by looking at the relationship between time that students work while in school and student achievement averages (both as indicators of students' "employable skills") and several socioeconomic indicators such as parents' educational attainment, gross national product or gross domestic product, and indicators of household resources. In order to confirm this hypothesis there should be positive relationships between the indicators of employable skills and socioeconomic status. The one exception is the influence of gender on student employability. This relationship between time students work and gender should be insignificant, which suggests relative equality between employable skills and gender differences.

Our third technical-rational hypothesis is that employable individuals possess theoretical understanding of work-related processes rather than work-specific skills alone. This hypothesis can be tested by first looking at the relationship between time that students spend working and their student achievement, which according to this hypothesis should be a positive relationship. And secondly, by looking at how employment rates for recent school leavers associates with both time students work and student achievement. In order to confirm this hypothesis, we expect that the association between the student level relationship and the national level employment rate will be positive. If the relationship between levels is instead negative or insignificant, the

hypothesis cannot be confirmed and it is possible that theoretical understanding along with skills does not lead to employability.

The fourth technical-rational hypothesis suggests that making schools accountable to businesses and communities improves individuals' academic performance. This hypothesis can be tested by looking at the association between the amount of curricular influence that business and other community stakeholders have and the two student-level variables of achievement and time spent working. If this hypothesis is true, then the more curricular influence business and community stakeholders have, the higher students will perform regardless of the time students spend working. If the relationship between student achievement and curricular accountability is negative or insignificant instead of positive, then this hypothesis cannot be confirmed and it is possible that increased accountability to businesses and communities either has a deleterious effect on student achievement or that accountability measures are reactions to preexisting problems with student achievement. We would like to point out that although time students spend working is included in this equation, it should not be a significant predictor as much as a control factor. If this "control" variable has significant influence in either direction, then it is possible that the association between curricular accountability and student achievement has important co-associations with other factors making this hypothesis too simplistic.

So far, our hypotheses all suggest that school to work transition is a technical-rational process, and as such can be predicted and manipulated by reform in either educational policy, practice, or both. However, school to work transition is not only a viable method of transferring knowledge of specific, immediately employable skills to students, but it is also a way to instill skills of adaptability and contextual sensitivity in both employment and social settings (Benavot 1983). In other words, the organizational environment of schools may influence school to work

transition programs. The effect being that school to work transition may be decoupled (Meyer & Rowan 1977) from immediate outcomes and instead have future individual benefits, but immediate organizational benefits.

Therefore, our neo-institutional hypothesis is:

(H5) school-work relationships, once institutionalized, persist and are maintained regardless of their actual technical output or original incentives and

Our fifth hypothesis suggests a neo-institutional argument that school-work relationships, once institutionalized, persist and are maintained regardless of their actual technical output or original incentives. This hypothesis, therefore, suggests that any relationship between curricular accountability (as in the fourth hypothesis), time students spend working, and student achievement should be insignificant. If a significant relationship is found in either a positive or negative direction then there is a relationship that is more causal that associational. This sort of significant association would disprove this hypothesis since any sort of significant relationship suggests causality even if causality cannot be claimed without further more exhaustive analysis.

METHODS

Data

Since school to work transition policies often rely on international comparisons of student achievement and employment rates to determine the needs and allocate resources for improved transition, we use comparative data for the U.S. 12th grade-equivalent student, teacher, and

principal questionnaires from the Third International Mathematics and Science Study (TIMSS) collected in 1995. Along with simple descriptive statistics and bivariate correlations, we use multilevel multivariate regression to analyze and predict the nested relationships between students, schools and their communities, and relevant national-level factors (Bryk & Raudenbush 1996).

TIMSS was conducted during the 1994-95 school year in 45 nations, and roughly 40 participating nations collected sufficient data for analysis here. In TIMSS, each nation used a two-stage sampling design. The first stage consisted of a probability-proportionate-to-size sample of schools selected from a sampling frame of all schools in that nation enrolling most of the students in the targeted grade level. The second stage sampled up to two classrooms per school with an equal probability of selection, and all students in these classrooms were included in the study. Mathematics and science achievement tests as well as background questionnaires for students, teachers, and principals were designed to be comparable across nations. The TIMSS study developed sampling weights to adjust for disproportional sampling of subgroups and non-response (Gonzalez & Smith 1997).

Education-Work Linkage Indicators

Time students work (mean=1.30, sd=1.68) is a categorical measure of the hours per week students report that they work at paid jobs while they are also in school, ranging from 0 meaning "no time" to 4 meaning "more than 5 hours." Time students work serves as one of the dependent

variables representing the education-work link. This data is taken from the U.S. 12th grade equivalent student background questionnaire administered as part of TIMSS.[1]

Post-secondary expectations is comprised of student-reported measures of the expectations that their friends, parents, and teachers have for them after they leave school. It is a composite measure of these different stakeholders' expectations, and as such is an average of these measures. The three post-secondary expectation variables derived from these student reports are *job, trade, and university expectations*. *Job Expectations* (mean=.09, sd=.22) is a measure of whether or not friends, parents, and teachers expect students to get a full-time job after leaving school. *Trade Expectations* (mean=.13, sd=.28) is a measure of whether or not friends, parents, and teachers expect students to either attend a trade school or join the military after leaving school. *University Expectations* (mean=.60, sd=.42) is a measure of whether or not friends, parents, and teachers expect students to attend university full-time after leaving school. This data is taken from the U.S. 12th grade equivalent student background questionnaire administered as part of TIMSS.

Student achievement (mean=500.45, sd=97.36) is a composite measure of students' math and science achievement scores. This data is taken from the general math and science achievement tests given to U.S. 12th grade equivalent students as part of TIMSS.

Education-Work Policy Indicators

Curricular accountability (mean=.49, sd=.78) is a school level measure of whether or not principals report that businesses have a lot of curricular influence. This is a categorical variable with 3 indicating a lot of curricular influence and 0 indicating none. This data is taken from the

[1] Variable name is CSBGPAID.

U.S. 12th grade equivalent school background questionnaire administered as part of TIMSS. *GNP* (mean=16.89, sd=11.28) is a nation level measure of 1995 gross national product per capita in thousands of US dollars for each nation in the analysis. The data for *GNP* is taken from the World Bank (1996). *Unemployment rate* (mean=8.27, sd=5.61) is a nation level measure indicating a nation's unemployment rate of persons aged 25-64 with upper secondary education for 1995. This data is taken from international unemployment statistics reported by the U.S. Department of Education (Baldi, Khalaf, Perie, & Sherman 2000) and supplemented with 1990s unemployment statistics from *The World Factbook* (2001).

Socioeconomic Status Indicators

Parents' education (mean=3.81, sd=1.48) is an average of a categorical measure of mothers' and fathers' level of educational attainment. This is a student reported measure and ranges from 1, which is some primary school, to 6, which indicates the parents have finished college. *Language* (mean=.90, sd=.30) is a measure of whether or not students speak the language of the test/instruction at home. It is a dummy variable where 1 means "always speaks language of test/instruction at home" and 0 means less than always. *Books* (mean=3.90, sd=1.13) is a categorical measure of number of books in the home. This student reported measure ranges from 1, which is 0-10 books, to 5, which is more than 200 books. *Female* (mean=.49, sd=.50) is a student reported dummy variable indicating a student's gender, where 1 is female and 0 is male. The data for *parents' education*, *language*, *books*, and *female* is taken from the U.S. 12th grade equivalent student background questionnaire administered as part of TIMSS.

Analyses

The analyses that test both the technical-rational and neo-institutional hypotheses are of many kinds: descriptive, bivariate, multivariate, and multilevel. We calculated by nation the descriptive statistics such as means and standard deviations for each of the measures described above. Tables showing these descriptive statistics are shown in the Appendix.

Bivariate correlations constitute the foundation of our analyses. Tests of our hypotheses led us to calculate the bivariate correlations of (Table 1) time students work versus post-secondary expectations, unemployment rates, and student achievement; and (Table 2) curricular accountability versus student achievement and time students work.

Multivariate, multilevel relationships are estimated for the relationship between the education-work link and contextual factors influencing school to work transition. The education-work linkage is represented by the *time students work, student achievement*, and *post-secondary expectations*, so these three variables should rotate as the main DV. The contextual influences on the education-work link are *SES, curricular accountability, unemployment rates,* and *GNP.*

I estimate three sets of multilevel analyses for each education-work link indicator (as the dependent variable) using the statistical software package HLM for Windows. The first model in each set of analyses includes only student-level control variables as predictors of the education-work link:

$$Y_{ijk} = \pi_{0jk} + \pi_{1jk}\,\mathrm{SES}_{ijk} + \pi_{2jk}\mathrm{Achievement}_{ijk} + e_{ijk}, \qquad (1)$$

where Y_{ijk} is one of the TIMSS measures of the education-work link for the i^{th} student in the j^{th} school within nation k, and e_{ijk} is a student-level residual. By assumption, $E(e_{ij}) = 0$ and $Var(e_{ij}) = \sigma^2$. Note that all of the regression coefficients in the student level equation (the πs) are indexed by both j and k, indicating that within the multilevel model a student-level regression coefficient is estimated for every j^{th} school in every k^{th} nation in the sample.[2] The term π_{0jk} is an estimate of an adjusted dependent variable for the j^{th} school in nation k.[3]

The second model in each set of analyses has the same student-level equation as the first, but we add to the first model an indicator of curricular accountability as an additional predictor of the education-work link.[4]

$$\pi_{0jk} = \beta_{00k} + \beta_{01k}\text{SES}_{jk} + \beta_{02k}\text{Achievement}_{jk} + \beta_{03k}\text{CurricularAccountability}_{jk} + r_{0jk} \quad (2)$$

The third and final model adds the indicators of GNP and unemployment rates. I include GNP and unemployment rates as predictors of the national mean of our education-work link

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[2] In this model, we permit the student-level relationship between the socioeconomic status indicator "books" and the education-work link to vary across schools and nations. By contrast, we constrain the coefficients for the socioeconomic status indicators "parents' education", "female", and "language" as fixed. The decisions to treat coefficients as "fixed" or "random" were based on chi-square tests for significant variation among the coefficients in the sample. Only the terms without significant variation were constrained to be fixed.

[3] For each set of analyses we initially estimated the mean of each school's education-work link indicator as a function of its mean socioeconomic status indicators: $\pi_{0jk} = \beta_{00k} + \beta_{01k}\text{SES}_{jk} + \beta_{02k}\text{Achievement}_{jk} + r_{0jk}$, where β_{00k} is the k^{th} country's national mean for the education-work link indicator in that model, and r_{0jk} is the residual difference between a school's mean education-work link indicator and its country's national average. Although the coefficient β_{01k} represents each schools "composition effects" and is included in the model to ensure that coefficients in Equation 1 reflect "true" student level relationships (see Bryk & Raudenbush 1992, pp. 117-123), the effects measured were small and insignificant. Therefore, we excluded these controls for "composition effects" from our final analyses.

[4] In the second model we also initially included as predictors of the national mean for our education-work link indicators each nation's mean value for curricular accountability: $\beta_{00k} = \gamma_{000} + \gamma_{001}\text{CurricularAccountability}_k + u_{00k}$. Again, these mean values were included as predictors of national-levels of the education-work link indicators, β_{00k}, to control for potential composition effects—in this case at the national level—and to ensure that the relationship β_{01k} is a true measures of the relationship between curricular accountability and the mean of our education-work link indicators at the school level. Again, however, these effects were small and insignificant, and therefore were not included in our final analyses.

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indicators and the school-level relationship between curricular accountability and the mean of our education-work link indicators:

$$\beta_{00k} = \gamma_{000} + \gamma_{001}\text{GNP}_k + \gamma_{002}\text{UnemploymentRates}_k + u_{00k}\,, \qquad (3)$$

RESULTS

1. Are schools training grounds for employment? The results of our analyses suggest that schools are not training grounds for employment. Table 1 shows that the relationship between the time that students work while in school versus their postsecondary expectations is largely small and insignificant, except for the expectation that students will attend university full-time. The relationship between time students work and university full-time is both negative and significant ($r=-.013$, $p<.01$). This relationship suggests that by encouraging or allowing students to "train" for future employment by working while in school does not associate with expectations for either immediate postsecondary employment nor vocational training. It does however, suggest that the more students are "trained" through work while in school the less they expect to immediately enter the workforce. In other words, what they learn about the world of work lessens their expectations of immediately entering the world of work. This evidences suggests, therefore, that school are not necessarily training grounds for employment.

Table 4 shows that when other factors are accounted for, the relationship between the time that students work while in school and the unemployment rate for recent school leavers in their country is small and insignificant. This relationship suggests that by encouraging or allowing students to "train" for future employment by working while in school does not associate

with the unemployment rate. Again, the evidence suggests that schools are not necessarily training grounds for employment because the benefit of work experience and skill training does not associate with employment rates.

2. Are individuals' employable skills and attributes the foundation for collective socioeconomic benefits and well being? Although the evidence is not unanimous, our results suggest that individuals' employable skills and attributes are largely not the foundation for collective socioeconomic benefits and well being. Table 1 shows that the relationship between the time that students work while in school and their student achievement is small and insignificant. Table 1 also shows that the relationship between expectations related to immediate postsecondary employment or vocational training and student achievement is both negative and significant. These relationships suggest that expectations of employment or work are not associated with high student achievement, but instead are associated with low student achievement. It might also suggest that it is students who are low achievers who expect and are expected to immediately enter the world of work. Interestingly, the relationship between student achievement and the expectation that students will attend university full-time is both positive and significant ($r=.288$, $p<.001$), suggesting that employable skills (represented by achievement) are more prevalent in those expecting to continue their education and postpone entering the workforce than among those who will more likely comprise the workforce upon leaving secondary school.

Table 3 shows that the relationship between time students work and indicators of socioeconomic status is more complicated. The association between time students work and parents' education level is positive and significant ($r=.037$, $p<.05$), but the association is negative and significant between time students work and the number of books in the home ($r=-.067$,

p<.001), the indicator of whether or not the students speaks that language of the test at home (r=-.056, p<.01), and female status (r=-.129, p<.001). While the negative associations are answered by conventional explanations of students from families with fewer resources having to work or work more in order to supplement either the family's or their personal income, the positive association between time students work and parents' education level is difficult to explain, and is the only indicator of the many shown here that suggests that individuals' employable skills gained through work experience while in school may be associated with positive socioeconomic benefits. Largely, however, our results suggest that individuals' employable skills and attributes are not the foundation for collective socioeconomic benefits and well being.

3. Do employable individuals possess theoretical understanding of work-related processes rather than work-specific skills alone? Our evidence suggests that the answer to this question is "yes" for the first part and "no" for the second. Again, we can look to Table 1 to see that the time students work (as an indicator of employable individuals) and student achievement (as an indicator of theoretical understanding rather than skill competency alone) is a small and insignificant association. Table 4 shows that the relationship between time students work and unemployment rate is small and insignificant as well, but that the relationship between student achievement and unemployment rate is negative and significant (b=-5.015, p<.001). Therefore, while time students work while in school does associate with actual postsecondary employment, student achievement does and in the direction that suggests that employable individuals do possess theoretical understanding of work-related processes. The interesting twist is that the negative and insignificant association between time students work and actual employment statistics suggests that work-specific skills of the kind frequently gathered through the type of work students do while in school does not make students employable later in their post-

secondary life. Therefore, our evidence suggests that employable individuals do indeed possess theoretical understand of work-related processes, but that employable individuals do not seem to benefit from work-specific skills.

4. Does individuals' academic performance improve when schools are made accountable to businesses and communities? Table 2 shows that curricular accountability and employment rates are not significantly related, suggesting that individual students post-secondary employability does not improve when schools are accountable to businesses and their communities. Table 4, however, gives a broader picture of the relationship of curricular accountability with not only academic performance, but also post-secondary expectations and in school work experience. In Table 4, curricular accountability is negatively and significantly related to student achievement ($b=-14.815$, $p<.001$). This suggests that in schools where students' achievement is higher, curricular accountability is lower. Conversely, in schools where students' achievement is lower, curricular accountability is higher. This evidence suggests that accountability to businesses and communities does not necessarily improve student achievement, but is instead a reaction to either higher or lower student achievement. In other words, in low performing schools, businesses have more curricular influence, but in high performing schools businesses have less curricular influence. Therefore, individuals' academic performance does not necessarily improve when schools are made accountable to businesses.

5. Do school-work relationships, once institutionalized, persist and are they maintained regardless of their actual technical output or original incentives? As shown in the answer to the previous question, there is a significant relationship between curricular accountability and student achievement, but that this relationship is negative, thus not supporting the fourth hypothesis. The significance of this relationship, however, does suggest that there is an

institutionalized school-work relationship. This is contrary to the rationale given in the original statement of this hypothesis earlier. The reason for this change in rationale is the unanticipated relationship between curricular accountability and post-secondary expectations. The relationship between curricular accountability and vocational post-secondary expectations is both positive and negative, but the relationship between curricular accountability and higher education post-secondary expectations is both negative and significant. This discrepancy between vocational expectations and higher education expectations suggests that although the school-work relationship is institutionalized, it is not maintained regardless of the technical output of schools (i.e., student achievement). Instead, these results suggest that once school-work relationships are institutionalized there is little variation in the technical output of the schools involved. Therefore, the answer to this question is that "yes" school-work relationships do persist, but that since the relationship between curricular accountability, post-secondary expectations, and the technical output of schools (i.e., student achievement) is split by vocational versus university expectations then the question about persistence regardless of technical output is an invalid question.

Our analyses suggest that at the institutional and national levels of analysis, technical processes that link school and work institutions are decoupled from their output so that instead of schools providing a close link with schools for economic advantage, school-work links instead legitimate schooling as an economically influential institution and encourage higher levels of educational attainment rather than technically rational and productive links to post-secondary employment. Results for individual level schooling and work expectations indicate that some employable skill transference occurs, but that this influence is minimized by the effects of institutional or national-level policy.

IMPORTANCE OF STUDY

Institutional links between schooling and work influence or shape educational policymaking in the United States and abroad (for examples see Stern, Bailey, & Merritt 1996). Therefore, educational policies, which assume tight school-work linkage result in technically-rational skill preparation and efficient transfer into the labor market, are misrepresentative of the institutional relationship between schooling and work. Our results suggest that policymakers should recognize the loosely-coupled nature of schooling-work linkages in order to make institutional and national-level policy that is more relevant to the characteristics of schooling for employability. As school to work transition persists as a policy and reform agenda in the United States, support for and integration of businesses' interests with mass schooling become tools for legitimization and symbolic achievement. Consequently, as institutionalized elements of schooling, these elements of environmental penetration into schooling become both dependent upon and necessary to schools' organizational legitimacy.

By determining the inadequacy of technical-rational perspectives at the national and cross-national levels using multilevel contextual analysis, we have shown that U.S. policy on school to work transition and school-work linkages is limited in its influence on technical output of these linkages such as employment rates for new graduates. Instead, we find that these policies and reforms are legitimizing efforts that may bring benefit to the U.S. and local communities regardless of the technical output of school to work transition programs and penetration of business-oriented influence and governance of schooling. Therefore, although the origins of school to work transition efforts may be based in idealized conceptions of relationships between school knowledge and training with vocational skills and employers' needs, the maintenance and further expansion of school to work transition policies and programs is guided

by needs for institutional legitimacy and penetration by organizational environments into schooling. So while conclusive evidence showing that school to work policies and programs lead to improved academic achievement and economic productivity does not exist, the emphasis on school to work policies and programs as tools for economic and educational legitimacy ensures their expansion across and within countries, regions, and communities.

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Table 1. Cross-national correlations between indicators of education-work linkage

			Post-Secondary Expectations			
		Time Students Work	Job Full-Time	Trade School or Military	University Full-Time	Student Achievement
Time Students Work	Pearson Correlation	.	0.004	-0.003	-0.013 **	0.008
	Student N		44878	44878	44878	48196
Job Full-Time	Pearson Correlation	0.004	.	-0.126 ***	-0.451 ***	-0.176 ***
	Student N	44878		47110	47110	47110
Trade School or Military	Pearson Correlation	-0.003	-0.126 ***	.	-0.478 ***	-0.118 ***
	Student N	44878	47110		47110	47110
University Full-Time	Pearson Correlation	-0.013 **	-0.451 ***	-0.478 ***	.	0.288 ***
	Student N	44878	47110	47110		47110
Student Achievement	Pearson Correlation	0.008	-0.176 ***	-0.118 ***	0.288 ***	.
	Student N	48196	47110	47110	47110	

*p<.05, **p<.01, ***p<.001

Table 2. Cross-national correlations between indicators of education-work policy.[a]

		Curricular Accountability	Unemployment Rates	GNP
Curricular Accountability	Pearson Correlation	.	-0.116	0.192
	School N		2784	2784
Unemployment Rates	Pearson Correlation	-0.116	.	-0.486
	School N	2784		3396
GNP	Pearson Correlation	0.192	-0.486	.
	School N	2784	3396	

[a] All coefficients are significant at the p<.001 level.

Table 3. Cross-national correlations of employability indicators versus socioeconomic status indicators.

		Socioeconomic Status Indicators			
		Parents' Education	Books	Language	Female
Time Students Work	Pearson Correlation	0.037 *	-0.067 ***	-0.056 **	-0.129 ***
	School N	2892	2894	2892	2894
Student Achievement	Pearson Correlation	0.317 ***	0.619 ***	0.355 ***	-0.165 ***
	School N	2966	2968	2966	2970

*p<.05, **p<.01, ***p<.001

Table 4. Cross-national multilevel regressions on education-work link indicators.

	Education-Work Linkage Indicators				
		Post-Secondary Expectations			
	Time Students Work	Job Full-Time	Trade School or Military	University Full-Time	Student Achievement
Education-Work Policy Indicators					
Curricular Accountability	0.075 ***	0.053 ***	0.029 ***	-0.094 ***	-14.816 ***
	(0.021)	(0.005)	(0.004)	(0.008)	(1.902)
Unemployment Rate	-0.025	-0.001	0.001	-0.005	-5.015 ***
	(0.024)	(0.002)	(0.006)	(0.005)	(1.158)
GNP	0.016	0.001	-0.001	-0.004	1.149 +
	(0.012)	(0.001)	(0.003)	(0.003)	(0.581)
Socioeconomic Status Indicators					
Parents' Education	-0.026 ***	-0.017 ***	-0.016 ***	0.041 ***	5.736 ***
	(0.007)	(0.001)	(0.001)	(0.041)	(0.277)
Books	-0.005	-0.019 ***	-0.011 ***	0.037 ***	10.432 ***
	(0.008)	(0.001)	(0.001)	(0.002)	(0.340)
Language	0.108 **	0.019 ***	0.042 ***	-0.071 ***	25.753 ***
	(0.038)	(0.006)	(0.007)	(0.009)	(1.585)
Female	-0.063 ***	-0.004	-0.055 ***	0.026 ***	-38.181 ***
	(0.017)	(0.003)	(0.003)	(0.004)	(0.726)
Variance					
Level 1	2.160	0.045	0.063	0.111	3443.168
Level 2	0.189	0.015	0.009	0.039	2527.194
Level 3	0.318	0.003	0.020	0.016	725.09298

+p<.1, *p<.05, **p<.01, ***p<.001

Table A1. Descriptive statistics of education-work linkage indicators by nation.

				Post-Secondary Expectations							
		Time Students Work		Job Full-Time		Trade School or Military		University Full-Time		Student Achievement	
Country ID	Country Name	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
36	Australia	1.550	1.788	0.099	0.213	0.149	0.286	0.574	0.412	524.75	92.78
40	Austria	0.575	1.232	0.276	0.351	0.152	0.294	0.277	0.359	514.43	73.95
124	Canada	2.204	1.821	0.082	0.201	0.090	0.230	0.687	0.392	524.31	78.77
196	Cyprus	0.492	1.205	0.076	0.179	0.277	0.386	0.546	0.425	443.02	66.59
200	Czech Republic	1.318	1.663	0.230	0.319	0.344	0.377	0.292	0.407	473.28	85.31
208	Denmark	1.977	1.792	0.092	0.228	0.218	0.346	0.382	0.400	527.76	78.04
250	France	0.840	1.322	.	.	.	.	.	.	505.20	71.15
280	Germany	1.570	1.606	0.142	0.255	0.221	0.325	0.417	0.364	494.96	85.66
348	Hungary	0.892	1.392	0.228	0.352	0.139	0.287	0.452	0.456	476.94	81.44
352	Iceland	2.320	1.799	0.088	0.238	0.036	0.151	0.639	0.398	541.30	74.48
376	Israel	1.215	1.600	0.021	0.098	0.608	0.411	0.183	0.314	450.43	108.73
380	Italy	0.578	1.182	0.243	0.305	0.035	0.121	0.563	0.385	473.22	77.97
440	Lithuania	0.775	1.403	0.125	0.243	0.063	0.183	0.615	0.388	464.98	77.71
528	Netherlands	2.279	1.775	0.158	0.304	0.052	0.173	0.540	0.434	558.83	81.64
554	New Zealand	1.952	1.720	0.102	0.217	0.068	0.183	0.442	0.422	525.10	89.54
578	Norway	1.732	1.794	0.099	0.222	0.211	0.332	0.393	0.395	535.97	85.15
643	Russia	0.241	0.829	0.036	0.112	0.272	0.374	0.588	0.425	475.83	80.57
717	South Africa	0.860	1.441	0.120	0.190	0.097	0.188	0.454	0.359	352.43	85.48
752	Sweden	1.043	1.518	0.135	0.266	0.225	0.333	0.342	0.384	553.13	85.49
756	Switzerland	0.956	1.439	0.358	0.395	0.095	0.239	0.206	0.344	530.09	83.58
840	USA	2.359	1.771	0.057	0.152	0.096	0.230	0.707	0.378	471.27	86.76
890	Slovenia	0.612	1.193	0.072	0.193	0.113	0.256	0.705	0.390	505.76	72.03
	International Mean	1.288		0.135		0.170		0.476		496.50	
	International Std Dev	0.672		0.086		0.133		0.159		46.24	

Table A2. Descriptive statistics of education-work policy indicators by nation.

Country ID	Country Name	Curricular Accountability		Unemployment Rate	GNP
		Mean	Std Dev		
36	Australia	.	.	6.20	18.72
40	Austria	.	.	2.90	26.89
124	Canada	.	.	8.60	19.38
196	Cyprus	0.458	0.658	5.00	10.38
200	Czech Republic	1.178	0.932	2.10	3.87
208	Denmark	0.511	0.856	8.30	29.89
250	France	0.595	0.806	9.90	24.99
280	Germany	0.762	0.863	7.90	27.51
348	Hungary	0.078	0.348	9.40	4.12
352	Iceland	0.380	0.659	2.70	24.95
376	Israel	1.240	0.970	9.00	15.92
380	Italy	0.075	0.331	7.90	22.10
440	Lithuania	0.374	0.704	10.80	1.90
528	Netherlands	0.065	0.249	4.80	2.40
554	New Zealand	0.074	0.281	3.30	14.34
578	Norway	0.532	0.590	4.00	31.25
643	Russia	0.086	0.340	10.50	2.24
717	South Africa	0.456	0.809	30.00	3.16
752	Sweden	1.059	0.670	8.70	23.75
756	Switzerland	1.174	0.881	2.80	40.63
840	USA	1.025	0.715	5.00	26.98
890	Slovenia	0.661	0.710	7.10	8.20
	International Mean	0.567		7.59	17.44
	International Std Dev	0.408		5.72	11.46

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